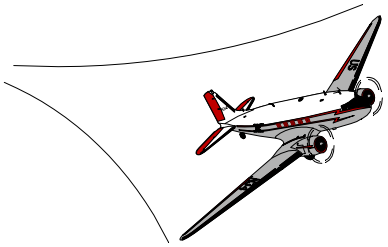
SPECIAL AIRWORTHINESS INFORMATION BULLETIN



Aircraft Certification Service
Washington, DC

U.S. Department of Transportation

Federal Aviation Administration

CE-04-74
August 3, 2004

www.faa.gov/certification/aircraft

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin alerts you, owners and operators of **Cirrus Design Corporation (CDC) SR20 or SR22 airplanes**, of possible loss of left or right braking.

Background

In January 2004, an accident occurred involving a CDC SR22 that experienced left brake failure during landing rollout. Examination of the aircraft revealed that the left brake line wall had worn through due to chafing against the retaining hardware for the lower strut fairing. CDC has issued Service Bulletin SB 2X-32-08 to correct the problem.

Recommendation

We recommend that you complete CDC's SB 2X-32-08 (attached) within the next 30 days.

For Further Information Contact

Wesley Rouse, Aerospace Engineer, FAA Chicago Aircraft Certification, 2300 E. Devon, Des Plaines, IL 60018; phone: (847) 294-8113; email: wess.rouse@faa.gov

Service Bulletin

SB 2X-32-08

Issued: 2004/04/08

Model SR20 and SR22

ATA 32-10: Main Gear
Brake Line Inspection and Anti-Chafe Spacer Installation

COMPLIANCE

Mandatory: Cirrus Design considers this Service Bulletin to be MANDATORY. Accomplish this Service Bulletin at the next maintenance or within the next 6 calendar months, whichever occurs first. Compliance time begins upon receipt of this Service Bulletin.

EFFECTIVITY

Cirrus Design SR20 serial numbers 1005 through 1316.

Cirrus Design SR22 serial numbers 0002 through 0914.

APPROVAL

FAA approval has been obtained on all technical data in this Service Bulletin that affects type design.

PURPOSE

The main landing gear brake line may experience chafing from the lower strut fairing on some affected airplanes. This condition could cause the brake line to fail which would result in diminished or no braking.

DESCRIPTION

This Service Bulletin contains instructions for brake line inspection and installation of anti-chafe spacers to the upper and lower nutplate clips on the lower strut fairings.

WARRANTY INFORMATION

Cirrus Design will cover parts and labor costs for this Service Bulletin if the work is accomplished within the next 12 calendar months and the work is accomplished at an authorized Cirrus Design Service Center or at the Cirrus Design factory. The Warranty Claim Form must be properly filled out and submitted with the removed parts to Cirrus Design in order to obtain a warranty credit.

Cirrus Design Corporation
4515 Taylor Circle
Duluth, Minnesota 55811
PH (218) 727-2737

MANPOWER REQUIREMENTS

Inspection Condition - No Chafing Found : 0.25 Manhour

Anti-Chafe Spacer Installation: 0.25

Inspection Condition - Chafing Found, Less Than 10% Of Brake Line Wall Thickness: 0.50 Manhour

Chafing Depth Measurement: 0.25

Anti-Chafe Spacer Installation: 0.25

Inspection Condition - Chafing Found, Greater Than 10% Of Brake Line Wall Thickness: 4.5 Manhour

Chafing Depth Measurement: 0.25

Main Landing Gear Brake Line Replacement: 4.25

OTHER PUBLICATIONS AFFECTED

SR20 Airplane Maintenance Manual (p/n 12137-001)

SR20 Illustrated Parts Catalog (p/n 12138-001)

SR22 Airplane Maintenance Manual (p/n 13773-001)

SR22 Illustrated Parts Catalog (p/n 13744-001)

WEIGHT AND BALANCE

N/A

MATERIAL INFORMATION

The following parts are required to comply with this Service Bulletin. Parts can be obtained from Cirrus Design Spare Part Sales or an authorized Cirrus Design Service Center. Order Kit P/N 70071-001.

Item No.	Description	P/N or Spec.	Supplier	Quantity
1	Service Bulletin	SB 2X-32-08	Cirrus Design	1
2	Anti-Chafe Spacer	16108-001	Cirrus Design	4

ACCOMPLISHMENT INSTRUCTIONS

A. Remove key from ignition.

B. Ensure BATTERY and AVIONICS master switches are in OFF position.

C. Pull ESSENTIAL and NON-ESSENTIAL AVIONICS circuit breakers.

D. Remove RH and LH lower strut fairings. (Refer to AMM 32-10)

E. Inspect the brake line attached to the main landing gear strut assembly and identify any chafing between the brake assembly and lower strut fairing hardware. Repeat inspection and identify chafing on opposite brake line.

F. If no chafing is evident, install anti-chafe spacers. Perform the following steps. (See Figure 01)

1. At upper and lower nutplate clips on the lower strut fairing, slightly pry open clip and insert narrow end of anti-chafe spacer into clip.
2. Bend nutplate clip back down so that nutplates retain anti-chafe spacer.
3. Verify strut stand-off used to secure lower strut fairing to strut is installed and securely attached.

4. Repeat on opposite fairing and strut.
5. Install main landing gear fairings. (Refer to AMM 32-10)
6. Complete airplane records by noting compliance with SB 2X-32-08 in Airplane Logbook.

G. If chafing is evident, perform the required steps:

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Pin Feeler Gauge 0.0035 inch (0.089 mm)	-	Any Source	Measure Brake Line Chafing.
Straight Edge 2 inch (5.1 cm)	-	Any Source	Measure Brake Line Chafing.

Note: Brake line wall thickness is 0.035 inch (0.89 mm).

2. Place straight edge along brake line and use pin feeler gauge to measure chafing depth on brake line(s).
3. If chafing depth is less than 10% of brake line wall thickness (0.0035 inch (0.089 mm)), install anti-chafe spacers. Perform the following steps: (See Figure 01)
   a. At upper and lower nutplate clips on the lower strut fairing, slightly pry open clip and insert narrow end of anti-chafe spacer into clip.
   b. Bend nutplate clip back down so that nutplates retain anti-chafe spacer.
   c. Verify strut stand-off used to secure lower strut fairing to strut is installed and securely attached.
   d. Repeat on opposite fairing and strut.
   e. Install main landing gear fairings. (Refer to AMM 32-10)
   f. Complete airplane records by noting compliance with SB 2X-32-08 in Airplane Logbook.
4. If chafing depth is equal to or greater than 10% of brake line wall thickness (0.0035 inch (0.089 mm)), perform Procedure - Main Landing Gear Brake Line Replacement.

H. Main Landing Gear Brake Line Replacement (See Figure 02)

1. Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
SR20 serials 1005 thru 1194: *SR22 Serials 0002 thru 0005:* Brake Line Assembly	11727-001	Cirrus Design	Brake line replace-ment.
SR20 serials 1195 thru 1316*:* *SR22 Serials 0006 thru* 0914*:* Brake Line Assembly	14445-001	Cirrus Design	Brake line replace-ment.
Tie Down	MS3367-1-9	Cirrus Design	Brake line replace-ment.
Plastic Dead Blow Hammer	60515A4	McMaster Carr	Strut removal.
Plastic Wedge	5868A91	McMaster Carr	Strut removal.

Description	P/N or Spec.	Supplier	Purpose
Heat Gun	-	Any Source	Epoxy removal.
Putty Knife	-	Any Source	Epoxy removal.
Sandpaper	80 Grit	Any Source	Remove epoxy.
Isopropyl Alcohol	TT-I-735 Grade A or B	Any Source	Solvent cleaning.
Cotton cloth (clean, white, lint free)	-	Any Source	Solvent cleaning.
Neoprene Rubber Gloves	-	Any Source	Hand protection.
5 Minute® Epoxy Gel, 25 ml Syringe Dev-Tube	14240	Devcon	Secure brake line.
Lead Pencil	-	Any Source	Marking.
Applicator (Tongue Depressor)	-	Any Source	Epoxy application.
Paper Cup, 1/2 cup	-	Any Source	Epoxy application.

2. Remove upper strut fairing. (Refer to AMM 32-10)
3. Raise airplane on jacks. (Refer to AMM 7-10)
4. Cut and remove tie down securing brake line to lower strut.
5. Loosen breeze clamp securing braided grounding strap to brake line.
6. Disconnect and cap flexible brake line at upper end of strut.
7. Disconnect brake line fitting from support bracket at upper end of strut.
8. Disconnect flexible brake line at lower end of strut.
9. Remove nuts and washers securing strut clamp to canted rib.
10. Using the dead blow hammer, squarely strike upper side of strut near clamp fitting to move strut down and away from clamp fitting.
11. Insert and drive plastic wedge into gap between clamp and fitting to free strut from clamp.
12. Slide grommet down strut to brake assembly.

WARNING: **Verify no fuel leaks or fuel residue are present before applying heat to strut.**

CAUTION: The adhesive securing the brake line to the strut does not require a high degree of heat to disbond. Heat the adhesive to the point where it is slightly hot to the touch.

To protect the composite wing skin from heat damage, place a barrier on the wing skin such as a welding blanket, high temperature mat, or damp cloth before applying heat to the upper section of the strut near the wing skin.

13. With heat gun, apply heat to epoxy bonding brake line to strut channel. As epoxy heats and softens, pull brake line free from strut channel. Discard brake line.

CAUTION: Do not use power tools to remove epoxy.

Do not cut or gouge strut laminate when removing epoxy.

14. Using a putty knife and sandpaper, remove epoxy from strut channel.
15. Mark the position where the lower fitting on the newly installed brake line should be positioned:
    a. At bottom, aft edge of strut, measure 8.9 inches (22.6 cm) up and make a perpendicular reference line across strut face with pencil. (See Figure 02, Note 2)
16. Test fit new brake line:
    a. Place new brake line into upper support bracket and position to strut assembly.
    b. At top of strut where brake line enters strut channel and down approximately 6.0 inches (15.2 cm), verify brake line fits completely into strut channel so that top radius of brake line is flush with top of strut channel. (See Figure 02, Note 1)
    c. Verify flare on lower section of brake line aligns with reference mark on strut.
17. Solvent clean strut channel with isopropyl alcohol. Do not remove reference mark on strut.
18. Solvent clean brake line.
19. Mix approximately half of the syringe, or 12.5 grams, of epoxy.

    CAUTION: Place a drop cloth over wheel assembly to protect assembly from dripping epoxy.

20. Using wooden applicator, fill strut channel with epoxy until epoxy is flush with top of strut channel.
21. Install new brake line:
    a. Position brake line into upper support bracket, insert brake line into strut channel, and position brake line so flare on lower section of brake line aligns with reference mark on strut.
    b. Firmly press brake line into strut channel.
    c. At top of strut where brake line enters strut channel and down approximately 6.0 inches (15.2 cm), seat brake line completely into strut channel so that top radius of brake line is flush with top of strut channel. Use a wooden applicator to spread epoxy over brake line.
    d. Where brake line enters and exits strut channel, use a wooden applicator to spread epoxy over and around brake line.
    e. Wet a clean, lint free cotton cloth in isopropyl alcohol and clean up epoxy. Leave a thin coat of epoxy over top of brake line.
    f. Apply down pressure over brake line by applying tape over brake line at lower fitting and over bend on upper section of brake line. (See Figure 02, Note 3)
    g. Allow epoxy to cure for 2 hours.
22. Slide grommet up strut to canted rib strut fitting.
23. Move strut assembly up and towards strut fitting.
24. Position clamp fitting over grommet and install washers and nuts securing clamp fitting to canted rib fitting. Torque to 150.0 in-lb (16.9 Nm).
25. Connect flexible brake line at lower end of strut.
26. Connect brake line fitting to support bracket at upper end of strut.
27. Connect flexible brake line at upper end of strut.
28. Position breeze clamp around braided grounding strap and fasten to brake line.
29. Install tie down securing brake line to lower strut.
30. If required, repeat procedure on opposite side
31. Remove jacks and lower airplane. (Refer to AMM 7-00)
32. Final torque bolts securing strut(s) to canted rib(s) to 160.0-190.0 in-lb (18.1- 21.5 Nm)
33. Fill brake system. (Refer to 12-10)
34. Bleed brake system. (Refer to 32-42)
35. Install anti-chafe spacers. Perform the following steps: (See Figure 01)

a. At upper and lower nutplate clips on the lower strut fairing, slightly pry open clip and insert narrow end of anti-chafe spacer into clip.
b. Bend nutplate clip back down so that nutplates retain anti-chafe spacer.
c. Verify strut stand-off used to secure lower strut fairing to strut is installed and securely attached.
d. Repeat on opposite fairing and strut.

36. Install main landing gear fairings. (Refer to AMM 32-10)
37. Complete airplane records by noting compliance with SB 2X-32-08 in Airplane Logbook.

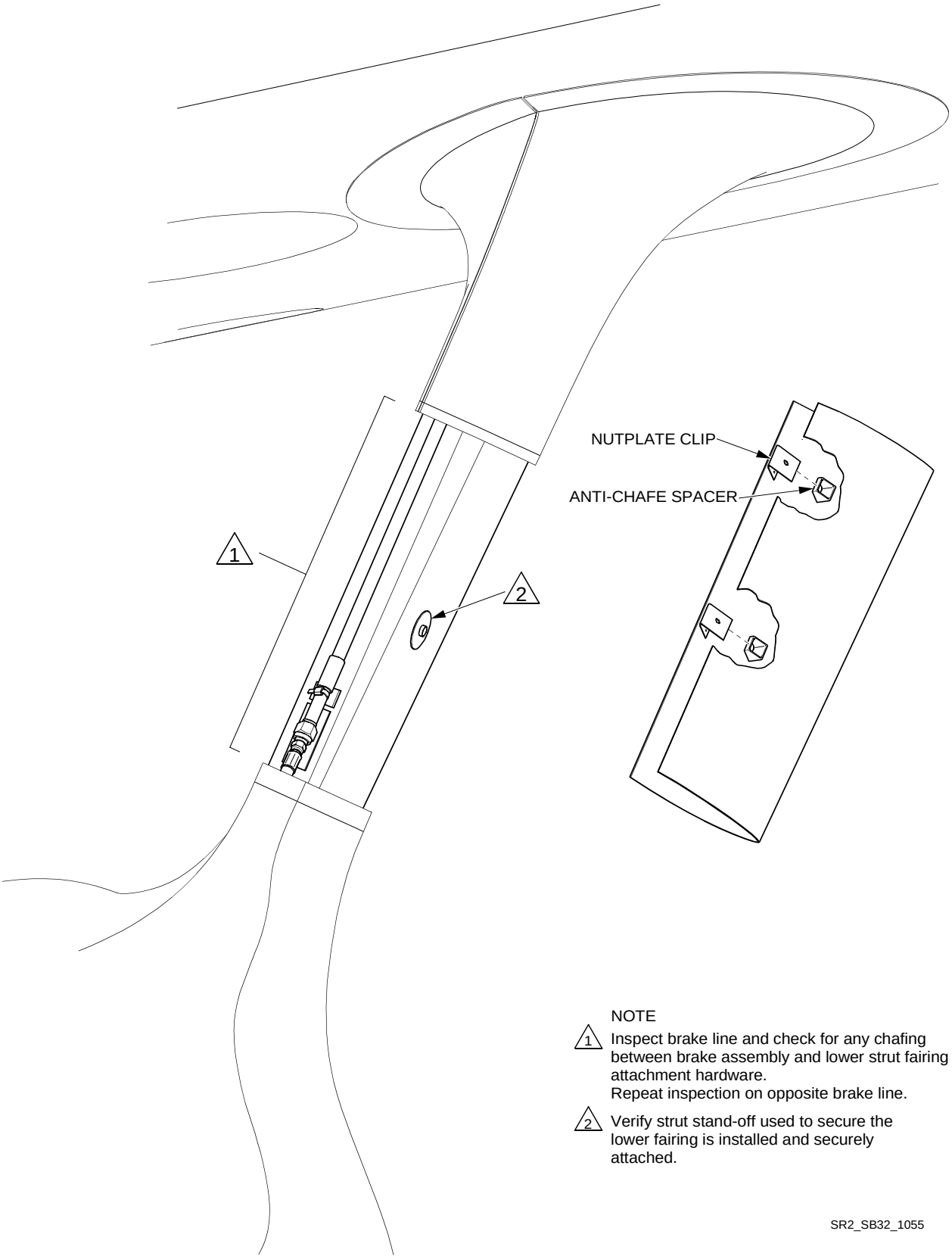
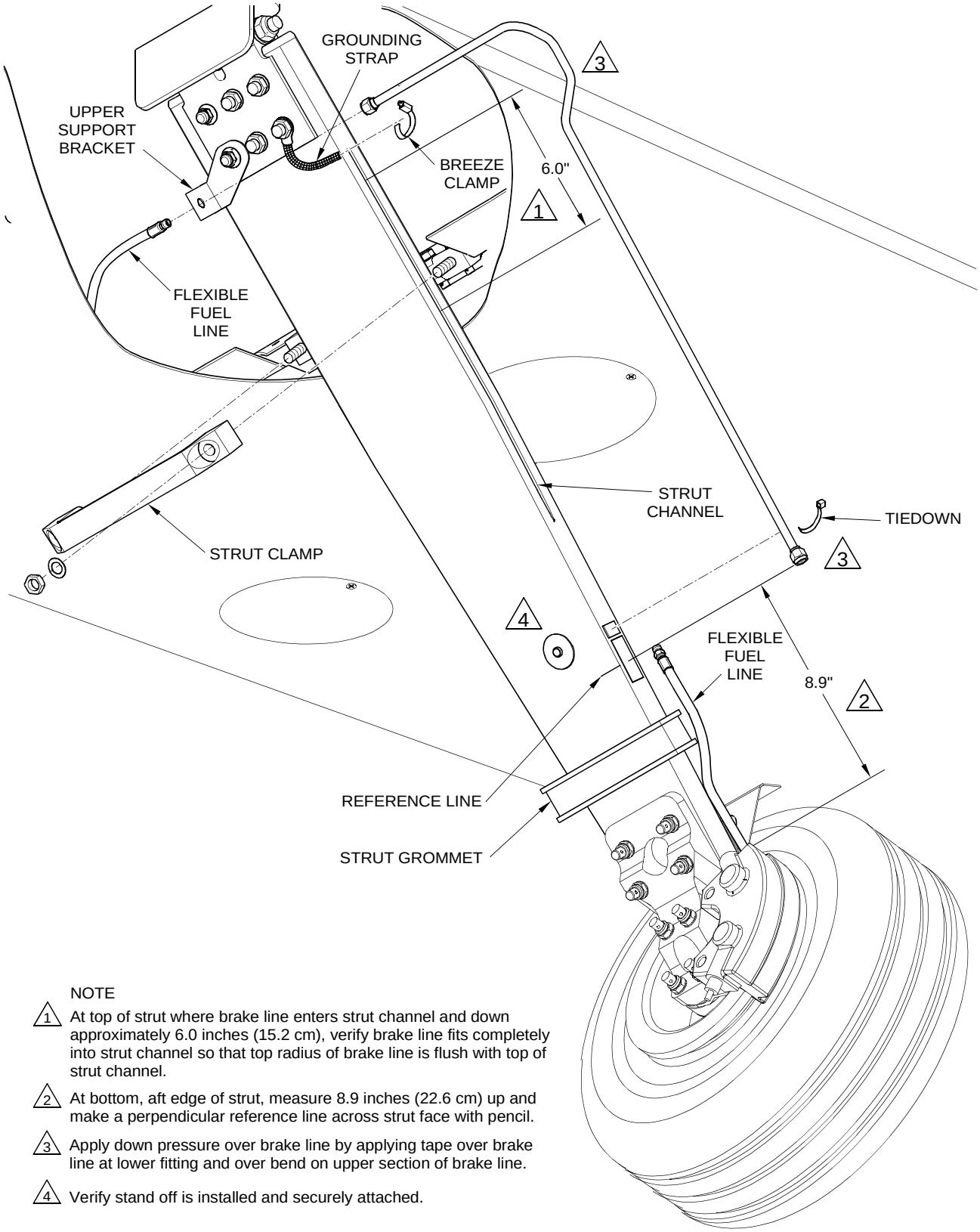


Figure 01 - Anti-Chafe Spacer Installation



NOTE

1. At top of strut where brake line enters strut channel and down approximately 6.0 inches (15.2 cm), verify brake line fits completely into strut channel so that top radius of brake line is flush with top of strut channel.
2. At bottom, aft edge of strut, measure 8.9 inches (22.6 cm) up and make a perpendicular reference line across strut face with pencil.
3. Apply down pressure over brake line by applying tape over brake line at lower fitting and over bend on upper section of brake line.
4. Verify stand off is installed and securely attached.

Figure 02 - Main Landing Gear Brake Line Replacement